Remarks:

Claims 1, 3-18 and 21-34 are pending in this application. Claims 22-34 have been added by way of this amendment. Claims 2, 19, and 20 have been cancelled by way of this amendment.

The disclosure has been amended at line 11 of page 4 in accordance with the Examiner's suggestion.

Claim Objections

The Examiner objected to Claim 19 because of informalities. Claim 19 has been cancelled by way of this amendment.

Claim Rejections – 35 USC 112

Claims 1, 3 and 4 have been amended to address the Examiner's 35 U.S.C. § 112 objections.

Claim Rejections – 35 USC 103

In the outstanding office action, the Examiner has rejected claims 1-5 and 17-21 under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent No. 5,241,536 to Grimble et al. (hereinafter "Grimble") in view of U.S. Patent No. 6,118,762 to Nomura et al. (hereinafter "Nomura").

In order to establish that any claim is obvious the Examiner must identify 1) all of the claimed elements in the prior art; 2) a reason or motivation to modify or combine these elements to arrive at the claimed invention; and 3) a reasonable likelihood of success (See M.P.E.P. 2141). It is submitted that the Examiner has failed to establish at least the first of these conditions.

Regarding claim 3, the Examiner asserts that Grimble discloses a space switch master controller comprising a source interface for receiving a stream of burst transfer requests, each of said burst transfer requests including parameters specifying a requested

connection and a duration for said requested connection. Reference is made to the passage, in Grimble, from col. 4, lines 65 to col. 5, line 12.

It is respectfully noted that the cited passage refers to Asynchronous Transfer Mode (ATM) cells, and not bursts of variable sizes. As is well known in the art, ATM cells are of equal and standardized size, which obviates a need for providing a duration of a cell. It is also respectfully submitted that a scheduler devised to handle bursts of variable sizes is distinct from a scheduler that is limited to handle ATM cells of fixed sizes. The bursts considered in the present invention are clearly characterized in the disclosure as being of variable sizes; see for example:

Page 2, lines 17-18:
"In accordance with an aspect of the present invention there is provided a method of controlling a space switch to establish time-varying connections, ...";

Page 7, lines 14-17:
"Parameters indicating the size (e.g., two megabits) and destination (e.g., a particular edge node 108B) of the burst are communicated from the port controller 206A to the master controller 210 as a burst transfer request."; and

Page 12, lines 25-29:
"If, as determined in step 805, there are no entries to schedule (i.e., waiting burst requests), the burst-scheduling unit 408 generates an artificial burst (step 816) where the size of the artificial burst is the "size of the selected burst" as far as step 902 is concerned. The result of this generation of an artificial burst is that (in step 814) the input port identifier 606 is written to a deferred time slot 604."

It is submitted that all the elements claimed in claim 3 are not found in Grimble or Nomura or a combination of Grimble and Nomura. Withdrawal of the rejection of claim 3 is therefore respectfully requested.

Regarding claim 4, the Examiner asserts that Grimble disclose a computer readable medium containing computer-executable instructions which, when performed by a processor in a space switch master controller, cause the processor to "receive bursts transfer

requests...". Reference is made to a passage found at col. 6, lines 56-62 of Grimble. Applicant respectfully notes that the cited passage refers to communicating results from time-slot utilization means along with the input port number and destination information. Applicant respectfully notes that the mentioned results relate to ATM cells as clearly described in the paragraph starting at col. 6, line 44. Claim 4 of the present invention refers to scheduling information based on parameters including a duration of a requested connection.

It is respectfully submitted that Nomura is also concerned with ATM cells.

It is submitted that all the elements claimed in claim 4 are not found in Grimble or Nomura or a combination of Grimble and Nomura. Withdrawal of the rejection of claim 4 is therefore respectfully requested.

As amended, the method of claim 1 requires "generating schedules for said burst transfer requests in an order in which input ports corresponding to said burst transfer requests become unoccupied". It is submitted that neither Grimble nor Nomura discloses an order corresponding to the activity of the input ports. Advantageously, the approach of the present invention minimizes input port idle time.

It is, therefore, submitted that all the elements claimed in claim 1 are not found in Grimble or Nomura or a combination of Grimble and Nomura. Withdrawal of the rejection of claim 1 is therefore respectfully requested.

Regarding Claims 5, 17 and 18, the Examiner refers to FIG. 6 in Grimble. Applicant respectfully notes that the apparatus of FIG. 6 in Grimble applies strictly to scheduling cells of equal size and that, consequently, there is no facility whatsoever to handle data bursts of variable sizes. Applicant further emphasizes that the scheduler embodying aspects of the present invention is based on judicial or preferential selection of an input port to minimize input idle time, then determining if the selected input port has waiting bursts, and if there are at least two waiting bursts at the selected input port, the scheduler selects the one of the waiting bursts that minimizes output-port idle time. If there is only a single waiting burst, the single burst is scheduled. If there are no waiting bursts, an artificial burst is created and a calendar is updated according to a size of the artificial burst. The scheduler of FIG. 6 in Grimble is based on selecting a waiting ATM cell, then examining the occupancy states of the

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input and output ports associated with the cell. There is no suggestion anywhere in Grimble (or Nomura) of a step of selecting an input port, to minimize idle time, before selecting a cell. Thus, the Grimble and Nomura references fail to suggest either of the two features (1) selecting an input port to minimize input idle time, or (2) selecting a burst waiting at the selected input port to minimize output idle time.

It is respectfully submitted that neither Grimble nor Nomura contemplates the use of judicial or preferential selection of an input port or an output port in a scheduling process. This is understood because there is little motivation to resort to such a process in an ATM switch.

Although the Nomura reference contemplates a burst transfer system, the entire disclosure is based exclusively on switching data units of fixed size, either in an ATM (asynchronous transfer mode) or a time-division-multiplex mode. Persons skilled in the art are well aware that a process of scheduling data bursts of variable durations is vastly more intricate than a process of scheduling data cells of fixed size. Please see Nomura col. 5, lines 33-39:

"The exchange unit 51 receives an ATM cell from an input path and discriminates an output path of the ATM cell with reference to a virtual path identifier VPI and a virtual channel identifier VCI. Then, the switching unit 51 transfers the received ATM cell to the output control unit 52 corresponding to the discriminated output path.".

Nomura does not suggest or imply a step of judicial selection of an input port in a scheduling process.

It is submitted that all the elements claimed in claim 5, as amended, are not found in Grimble or Nomura or a combination of Grimble and Nomura. Withdrawal of the rejection of claim 5 is therefore respectfully requested.

Similarly, it is submitted that all the elements claimed in claims 17 and 18, which provide a burst scheduler and a computer readable medium, respectively, for the method of claim 5, are not found in Grimble or Nomura or a combination of Grimble and Nomura. Withdrawal of the rejection of claims 17 and 18 is therefore respectfully requested.

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Similarly, claim 21, as amended, requires scheduling information to be generated "in an order in which input ports corresponding to said burst transfer requests become unoccupied". It is submitted that all the elements claimed in claim 21 are not found in Grimble or Nomura or a combination of Grimble and Nomura. Withdrawal of the rejection of claim 21 is therefore respectfully requested.

Allowable Subject Matter

Applicant thanks the Examiner for the indication that claims 6-16 contain allowable subject matter. Claim 6 has been amended to incorporate the limitations of original claim 5, on which claim 6 was dependent. The Examiner has indicated that, so amended, claim 6, and claims 7-16 dependent, directly or indirectly thereon, would be allowable.

Favorable consideration and allowance of claims 1, 3-18 and 21-34 of the application is earnestly solicited.

Respectfully submitted,

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